

Notice of Allowability

Application No.

10/700,227

Applicant(s)

KLEIMAN ET AL.

Examiner

Art Unit

Hetul Patel

2186

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to the amendment filed on June 28, 2007.
2. ☒ The allowed claim(s) is/are 1-12, 14-51 and 53; and they are renumbered as 1-14, 16-21, 24-35, 15, 22, 36-44, 23 and 45-51, respectively.
3. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some* c) ☐ None of the:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
- (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
- 1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
- (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☐ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3. ☐ Information Disclosure Statements (PTO/SB/08), Paper No./Mail Date _____
4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
5. ☐ Notice of Informal Patent Application
6. ☐ Interview Summary (PTO-413), Paper No./Mail Date _____
7. ☒ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other _____

DETAILED ACTION

Response to Amendment

1. This action is responsive to communication filed on June 28, 2007. This amendment has been entered and carefully considered. Claims 1, 22, 26, 29-33, 36, 39, 42 and 44 are amended; claims 45-53 are newly added; and none of the claims are cancelled. Therefore, 1-12 and 14-53 are currently pending in the application..
2. Applicant's arguments filed on June 28, 2007 have been fully considered and are persuasive.
3. Claims 1-12, 14-51 and 53 are allowed; and they are renumbered as 1-14, 16-21, 24-35, 15, 22, 36-44, 23 and 45-51, respectively.

EXAMINER'S AMENDMENT

1. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.
2. Authorization for this examiner's amendment was given in a telephone interview with Shannen C. Delaney (Reg. No. 51,605) on 08/27/2007.
3. The application has been amended as follows:

CLAIM 22 (Currently Amended): (Renumbered as 24)

A method for distributing redundant information across disks of an array, comprising:

dividing each disk into blocks, the blocks being organized into stripes such that each stripe contains one block from each disk;

selecting ~~any one or more~~ blocks in a stripe layout of the stripe not used to contain data to contain the redundant information, wherein the selected one or more blocks used to contain the redundant information ~~is~~are located in any disk and wherein the location of the selected one or more blocks used to contain the redundant information is dynamically allocated in a non-fixed pattern before each write request ~~is completed~~ for each stripe is completed;

computing the redundant information based on contents of all other blocks in the stripe layout, regardless of whether the blocks contain data; and

writing ~~the stripe layout to the disks of the array~~ the data in one or more allocated blocks and the redundant information in the one or more selected blocks of the stripe that is written across the disks of the array.

CLAIM 31 (Currently Amended): (Renumbered as 33)

Apparatus for distributing redundant information across disks of an array, the apparatus comprising:

means for dividing each disk into stripes, with each stripe containing one block from each disk;

means for selecting ~~any one or more~~ blocks in a stripe layout of the stripe not used to contain data to contain redundant information, wherein the selected one or more blocks used to contain the redundant information ~~is~~are located in any disk and wherein the location of the selected one or more blocks used to contain the redundant information is dynamically allocated in a non-fixed pattern before each write request ~~is completed~~ for each stripe is completed;

means for computing the redundant information based on contents of all other blocks in the stripe layout, regardless of whether the blocks contain data; and

means for writing the data in one or more allocated blocks and the redundant information in the one or more selected blocks of the stripe that is written across the disks of the array~~the stripe layout to the disks of the array.~~

CLAIM 33 (Currently Amended): (Renumbered as 35)

A computer readable medium containing executable program instructions for distributing parity across disks of an array, the executable instructions comprising one or more program instructions for:

dividing each disk into stripes, with each stripe containing one block from each disk;

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selecting ~~any one or more~~ blocks in a stripe layout of the stripe not used to contain data to contain parity, wherein the selected one or more blocks used to contain the parity ~~is~~are located in any disk and wherein the location of the selected one or more block used to contain the parity is dynamically allocated in a non-fixed pattern before each write request ~~is completed~~ for each stripe is completed;

computing the parity based on contents of all other blocks in the stripe, regardless of whether the blocks contain data; and

~~writing the stripe layout to the disks of the array~~ the data in one or more allocated blocks and the redundant information in the one or more selected blocks of the stripe that is written across the disks of the array.

CLAIM 46 (Currently Amended): (Renumbered as 45)

A method for distributing redundant information across disks of an array with a plurality of blocks on each disk, comprising:

allocating data to blocks in a stripe layout, where the stripe layout represents a stripe across the disks of the array;

reserving unallocated blocks for storing the redundant information in one or more reserved unallocated blocks;

assigning the redundant information to the one or more reserved unallocated blocks in a non-fixed pattern; and

writing the data in the allocated blocks and the redundant information in the one or more reserved unallocated blocks as the stripe across the disks of the array.

CLAIM 52 (CANCELLED).

CLAIM 53 (Currently Amended): (Renumbered as 51)

The method of claim ~~52~~46, wherein the non-fixed pattern is created by the redundant information being stored in any block remaining after the data is allocated to blocks of the stripe.

REASONS FOR ALLOWANCE

4. The following is an examiner's statement of reasons for allowance:

The prior arts of record do not teach nor suggest, either alone or in combination, all the limitations of independent claims of the current invention (claims 1, 22, 31, 33, 36, 39, 42, 44 and 46); particularly a method, system, program and an apparatus that in which at least one block is dynamically assigned/allocated in a *non-fixed pattern (in any disk)* for storing the parity/redundant information/data *before* completing each write request for each stripe.

Claims 2-12, 14-21, 23-30, 32, 34-35, 37-38, 40-41, 43, 45, 47-51 and 53 further limit the allowable independent claims. These claims are therefore allowable for the same reason as set forth supra.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

4. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Hetul Patel whose telephone number is 571-272-4184. The examiner can normally be reached on 8:00 - 5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Matt Kim can be reached on 571-272-4182. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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